



SPACE SHUTTLE PROGRAM
Space Shuttle KSC Integration Office
NASA Kennedy Space Center, Florida



STS-130 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-21-09**

Program Freeze Point

PRCB Presentation

S115130B



STS-130 Launch Site Flow Review

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Baseline the STS-130 Mission Specific Requirements and Flow Plans.

The STS-130 Integrated Launch Site Requirements were established by PRCBD S115130A dated 04-23-09. This CR and the Associated Data Package were reviewed at the 05-18-09 FRWG.

Flight Management

Orbiter Engineering*

Payload/Cargo Engineering*

Launch Vehicle Processing*

Requesting Approval

Status in BackUp

KSC Integration

Flight Software

Orbiter GFE

EVA

KSC ISS and Payload Processing

MO3/USA-PI

USA-OE

USA-PI

PH-B2

MK-SIO

USA-FSW

MV5

XA

UB-R3

SSME

Baseline at DLSFR

MP21



STS-130 LSFR

PRCB Flight Requirements Status

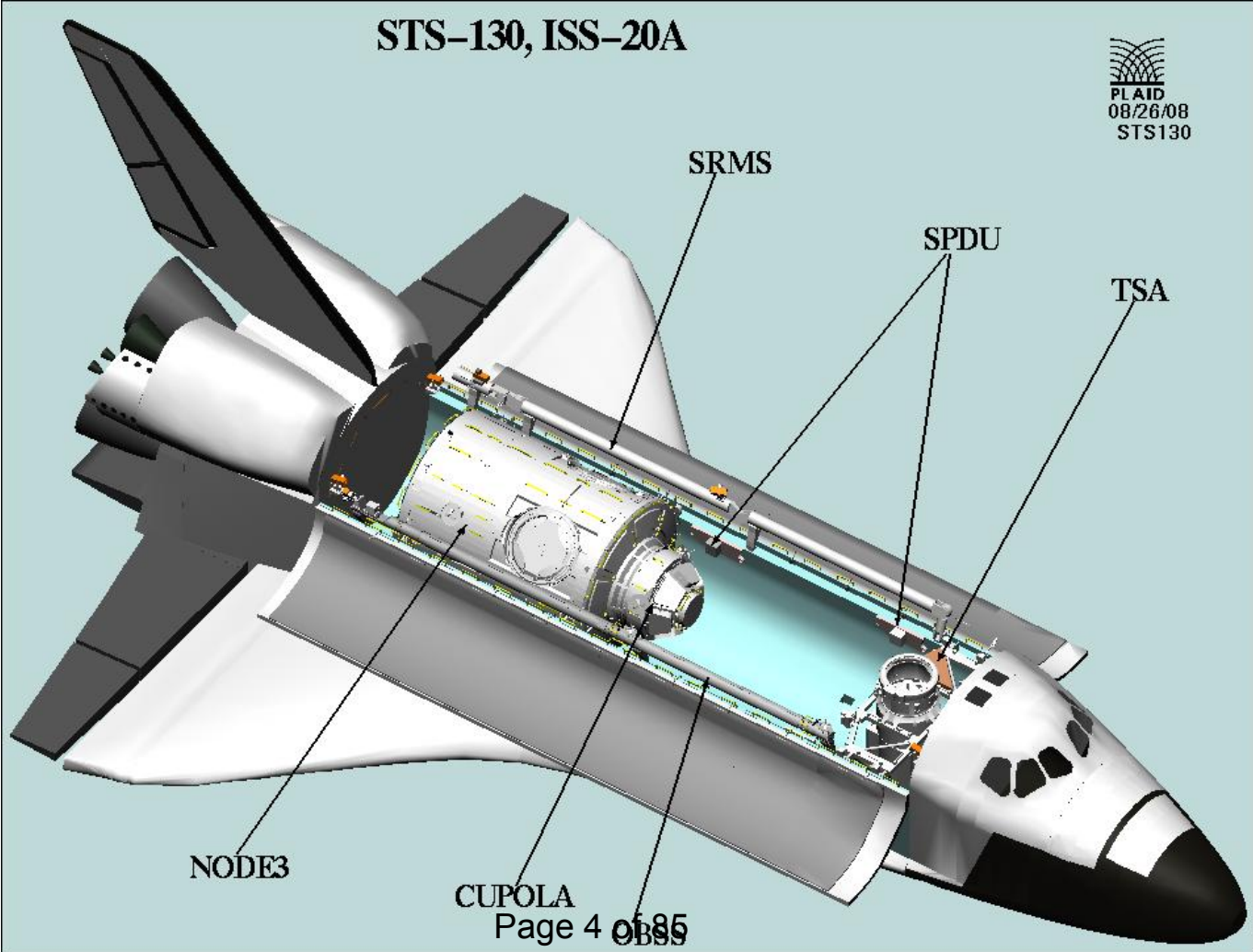
May 21, 2009

**Todd Hellner, Lead MIM
James Flores, USA Flight Mgr.**



STS-130 LAUNCH SITE FLOW REVIEW

Presenter	Todd Hellner
Date	May 21, 2009





STS-130 LAUNCH SITE FLOW REVIEW

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LAUNCH

02/04/10
 39A/ MLP 2
 CREW SIZE: 6UP/6DN

CONFIGURATION

OV-105(24)
 OMS: LP03;RP04
 ET-134
 BI-141
 RSRM-109
 SSME: (1) TBD (2) TBD (3) TBD
 OI-34
 SSPTS, SRMS, OBSS,
 ODS, SPDUS

PAYLOAD

ISS-20A (NODE 3 W/ CUPOLA)
 MAUI
 SEITE
 SIMPLEX

ORBIT

51.6 DEG
 122 NM
 DIRECT INSERTION
 DURATION: 12 + 1 + 2 DAYS
 EVAs: 3 + 1

CONSUMABLES

CRYO TANK SETS	5 (OFFLOAD 500 LBS)
GN2 TANKS	6 (OFFLOAD 66 LBS)
FWD RCS	1912# (MIN)
AFT RCS	4970# (FULL)
OMS	22760# (FULL)

LANDING

SITE	KSC
TAL	ZARAGOZA
ALT. TAL	MORON & ISTRES
SCA	905

RESCUE FLIGHT FOR STS-129



STS-130 LAUNCH SITE FLOW REVIEW

Presenter Todd Hellner
Date May 21, 2009

PERFORMANCE MARGIN

- SIMULATION MARGIN (OCFAF130) +1552

- WEIGHT CHANGES SINCE SIMULATION
 - ORBITER +103
 - MPS PROP (NOT INERT) +260
 - RECONSTRUCTED ASCENT PERF COLLECTOR - 94
 - TOTAL WEIGHT CHANGES +269 - 269

- OTHER PERFORMANCE PROJECTIONS
 - PROTECTION FOR DOL DISPERSIONS - 700
 - USABLE IMPULSE FOR MPS BGT GEN0901S - 17
 - SRB – M.P. UPDATES - 4
 - SRB – BR / 0.35 MIL HIGHER THAN 0.3705 AVG +70
 - ISP/THST FOR GEN BLOCK 2 @ 104.5% +6
 - PROJ TO 3 MIN WINDOW FROM INPLANE - 300
 - PERFORMANCE CHANGES ADJUSTMENT +19

- CURRENT BASELINED APM (05/12/09) +357

VOLUME III: ASCENT PERFORMANCE MANAGER'S RESERVE GUIDELINE AT LSFR IS 400 LBS



STS-130 LAUNCH SITE FLOW REVIEW

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FLIGHT MASS PROPERTIES

<u>CASE</u>	<u>TOUCHDOWN</u> <u>WEIGHT pounds (LIMIT)</u>	<u>MACH 3.5</u> <u>X C.G. inches (LIMIT)</u>
NOMINAL	200758 (233000)	1081.7 (1075.2)
RTLS	239115 (245000)	1083.2 (1076.7)
TAL	237731 (244000)	1083.3 (1076.7)
AOA	234042 (242000)	1080.9 (1075.2)
CONT RTRN*	235507 (233000)	1082.9 (1075.2)

*CONT RTRN EXCEEDS 233K NEOM LIMIT (See Vol. X Bk. 1 Sec. 3.3.1.1.9)
 (NO DOCK PLS CASE)

NOTE: RTLS INCLUDES 185 SEC ARCS & 25 SEC FRCS DUMPS
TAL INCLUDES 120 SEC ARCS & 65 SEC FRCS DUMPS
126 LBS AFT BALLAST (EMPTY BOXES)

ESTIMATES BASED ON OCF130 AND MODIFIED FOR WEIGHT CHANGES THRU 05/12/09.



STS-130 LAUNCH SITE FLOW REVIEW

Presenter

Todd Hellner

Date

May 21, 2009

Flight Requirements Status

PRCB CR's

- None

20A MIP (NSTS 21549):

- Current version available on PILS: Basic + Chg 1-3, 3/5/09
- Pending MIP CRs:
 - CR 007, Updates from CIR

STS-130 FRD (NSTS 17462-130):

- Latest revision: 003, dated 3/17/09
- No Pending FRD CRs

Issues/Concerns:

- None Identified

STS-130 OV-105 Flight 24 LSFR Orbiter Element

Kim Guodace
Scott Copenhaver

USA/OE
Boeing / VMMO

May 21, 2009

STS-130 OV-105 Flight 24 LSFR Orbiter

Purpose:

- Obtain program authorization for baseline of modifications to be performed prior to STS-130, OV-105 Flight 24.
 - Mandatory Mods – No new requirements
 - Potential Mods – None
 - Mission Kit Mods – None
- Present summary of other requirements
 - RCNs / Chits

Back-up

- Modification Matrix
- Open Mod Certification
- BRI-18 priority status
- Description of baselined mods

STS-130 OV-105 Flight 24 - LSFR Baseline

The following modifications have been baselined at a previous review (LSRR)

- **30231 – Rudder Speed Brake Inconel Thermal Barrier Redesign**
 - Installs redesigned Rudder Speed Brake inconel thermal barrier tabs to improve strength of the tab attachment
- **30250 – O2 Crossover Valve Signal Talkback**
 - Modifies Orbiter electrical configuration for the O2 crossover valves to provide valve position indication pre-launch
- **Mod Details in Back-up**

Mission kit modifications baselined

- **None identified**

Potential modifications baselined

- **None identified**

STS-130 OV-105 Flight 24 – Attrition Modifications

Significant Attrition Modifications

- **BRI-18 and other TPS priorities**
 - To be addressed at Delta LSFR

New Attrition Modification for TPS Planning

- **Aft Stub Tile Upgrade**
 - Improve damage resistance to aft stub tiles adjacent to the body flap
 - Aft stub carrier panel tile damage seen on multiple flights
 - Attributed to collateral damage during ground processing
 - Inspections being performed via chit at the pad prior to each flight
 - Changes aft stub carrier panel tiles to AETB-8 by attrition (excludes the 8 tiles at the centerline previously upgraded to FRCI-12)

RCNs/Chits

The following are presented for information only

Pending RCNs No.	Title/Description	Notes
OV17957	O2 Supply Crossover Valve Verification	In review. Adds verif. Of new MSIDs per mod MCR 30250
OV17959	OBSS V-Guide Inspection Clarification	In review
OV17826	APU GN2 QD Heater Functional Adds functional checkout of new QD heaters	In review

Chit No.	Title	Description
J6116	AMES Gap Filler Removal and Replacement	Approved prior to STS-118. Priority areas completed.
J6275A	Orbiter Structure IML Surface Corrosion Sampling Inspection	Approved
J6379	OV-105 Body Flap (BF) Power Drive Unit (PDU) Gearbox Fluid Level Inspection	Approved
J6414A	Rudder Speed Brake Thermal Tab Inspection	Approved
J6495	MAGR-3S Link-008 Firmware Upgrade on Remaining Receivers	Approved
J6507	Capture OV-105 Output Waveforms to Address 1N3600 Diode Concerns	Approved
J6509	Removal of MPS GH2 Flow Control Valve Following STS-125 (OV-104), STS-127 (OV-105), and STS-128 (OV-103)	Approved
J6514A	OV-105 Large Putty Repair Removal	In Review
J6515	WLE T-Seal / RCC Thermography	In Review
JXXXX	Node 3 Close Clearance Measurements of Orbiter Hardware	In Draft
JYYYY	Lockbolt Inspections	Potential
JZZZZ	Window fasteners with vespel inserts torque checks	Potential

STS-130/20A NODE3 / Cupola Launch Site Flow Review (LSFR)

Payload Cargo Engineering Status

ABBAS ELSABAGH

281.212.6186

05-21-2009

STS-130 LSFR

Engineering Flight Product Status

<u>Drawing No</u>	<u>Title</u>	<u>Released</u>
V072-200210	MECSLSI	02-27-09
VA72-200210	Cargo Arrangement	02-27-09
VD72-200210	Avionics Diagram	02-27-09
VS72-200210	Integrated Schematic	02-27-09
VS70-540365	Retention Schematic	02-27-09

- The above engineering released represent STS-130 CIR datapack on OV-105.

Engineering Open Work

- FRED

ECD: 06-05-2009

Standardization

- Mission Configuration does comply with Orbiter/Payload Integration Standardization Document NSTS 60523

STS-130 LSFR

Cargo Close Clearance Process

- 34 points on Node 3 have less than 1" dynamic clearance (all greater than 0.5")
- One point on Node 3 was identified to have dynamic interference of 0.4"
 - J6YY connector and MLI blanket to SRMS boom

CIR Assessment

Static Clearance: 2.15"

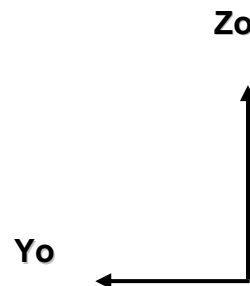
Dynamic Clearance:

Liftoff: 0.9"

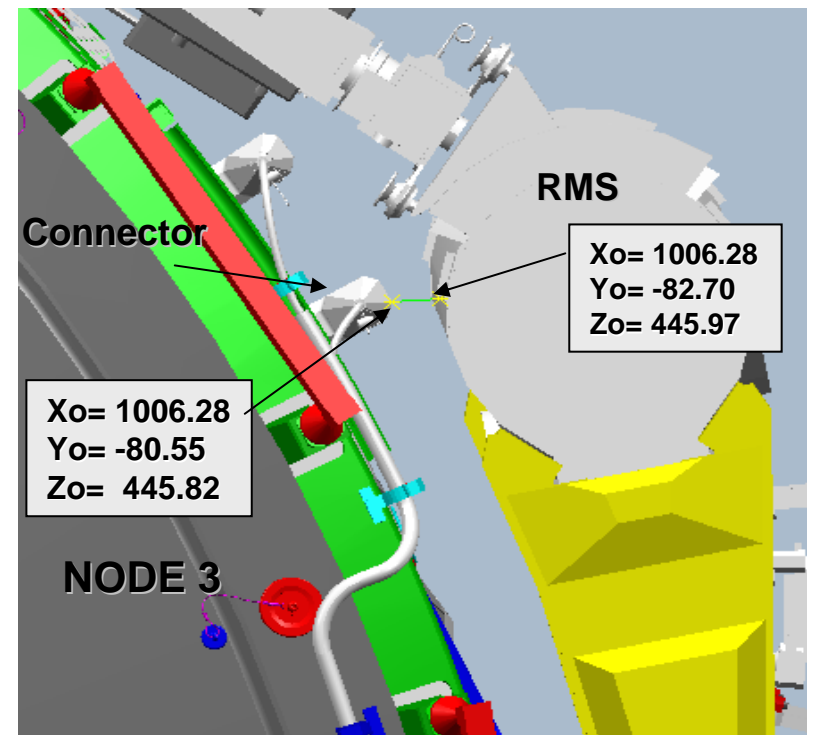
Ascent: -0.4"

Descent: 0.2"

Abort landing: -0.2"



NODE 3 J6YY Connector to RMS



STS-130 LSFR

Cargo Close Clearance Process (Continued)

- **Work completed to date includes:**
 - KSC measured the LTA cable connectors and provided the data to Alenia
 - CAD was updated and showed over 1” of height was removed from the connector CAD model
 - Updated CAD models were delivered to MSFC at the end of April
 - Boeing quick-look based on charts from Alenia estimates at least 0.5” of dynamic clearance

- **Forward work to complete official assessment of the clearance**
 - DPA measurement of Node 3 at end of May to measure the connector with and without the blanket
 - Complete Node 3 DPA list provided to ISS CAD 5/5/09
 - Optical measurements of Orbiter to be completed
 - Draft chit sent out for review 5/12/09
 - Official submittal of chit expected end of May
 - Measurements cannot be completed until return of STS-127/OV-105
 - Updated Node 3 CAD model, with DPA, to be used for final assessment of dynamic clearances

STS-130 LSFR

Cargo Close Clearance Process (Concluded)

Open Work

- Official submittal of chit to measure Orbiter close clearance points 05/29/09
 - Radiator, egress, wiretray, blankets and RMS
- Update assessment of dynamic clearance with updated CAD model including DPA measurements 09/15/09
 - Date dependent on amount of work to downsize CAD model updates
 - CAD model updates to be used to update SSP ICD figures

KSC Launch and Landing Project

STS-130

Launch Site Flow Review

May 21, 2008





Multi Flow

D. Hutcherson

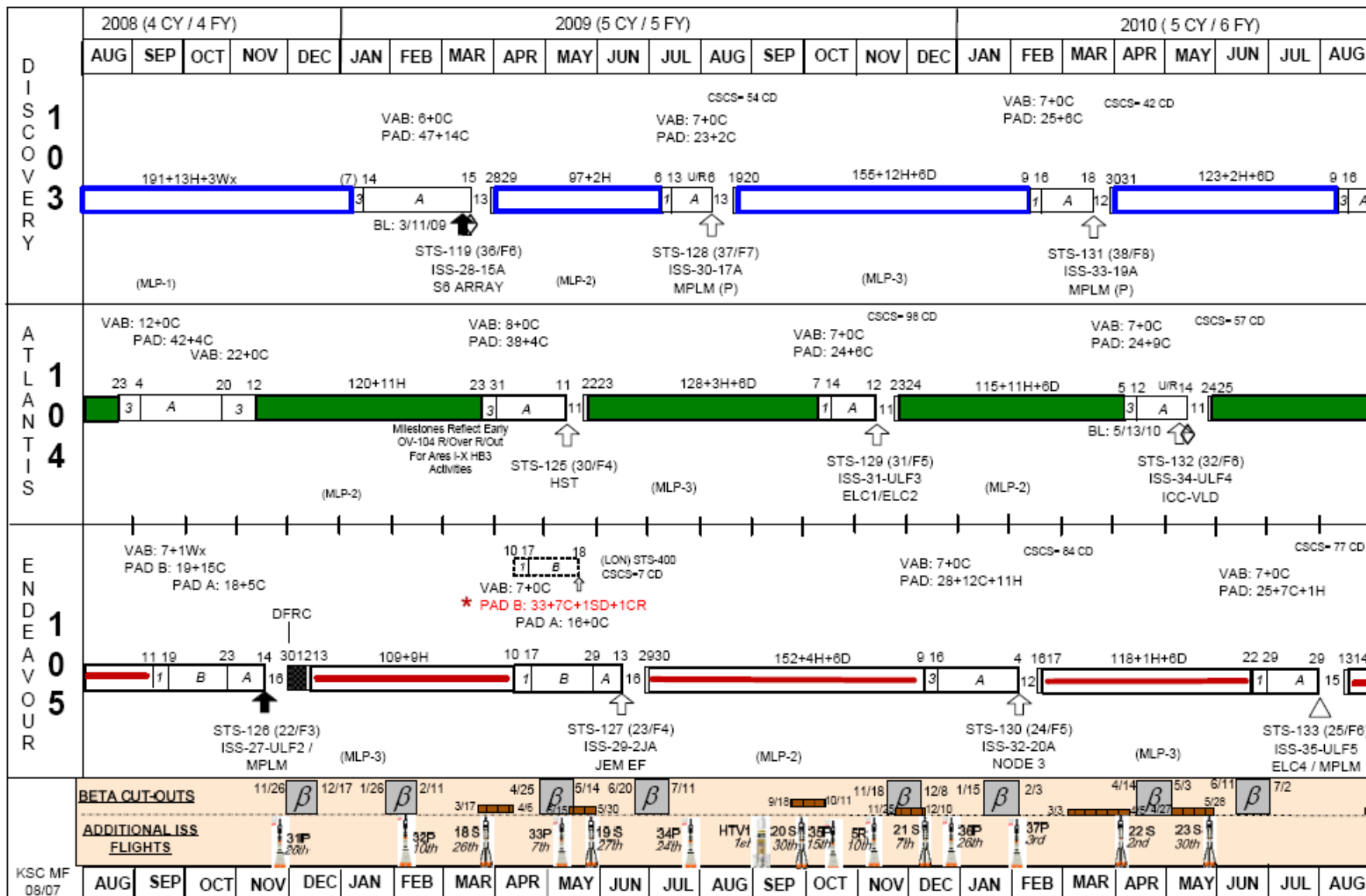


KSC ASSESSMENT / ORB MULTI-FLOW

SSP APPROVED MANIFEST

MANIFEST REF. 09A-17

1400 EDT, 1 MAY 2009



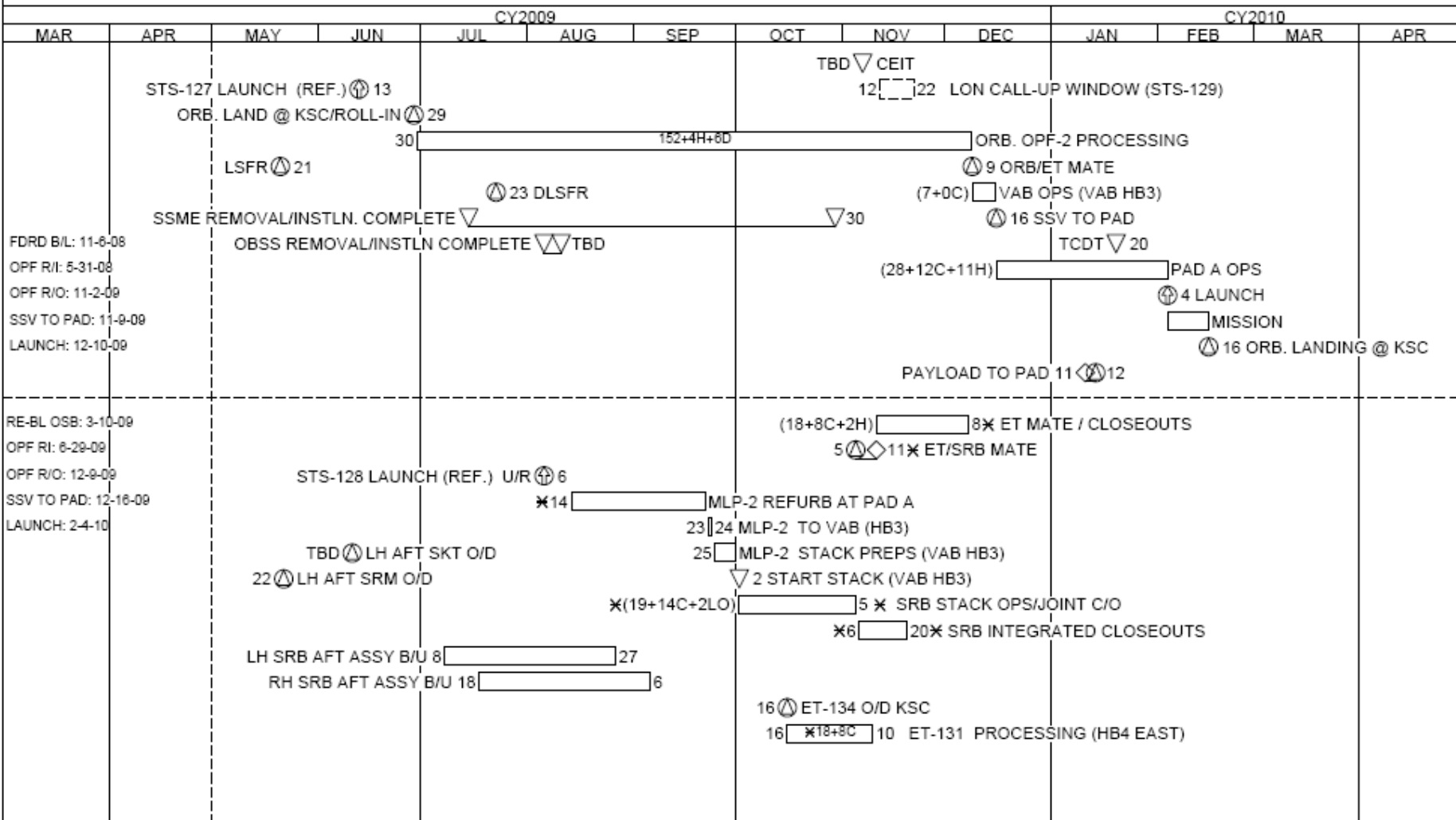
LEGEND
 H = HOLIDAY D = DRYDEN RESERVE C = PAD CONTINGENCY Wx = WEATHER OUTAGE
 CR = CREW REST DAY DFRC OPS 1/3 VAB OPS A/B PAD OPS MILESTONE
 OFF-1 OFF-2 OFF-3 Vehicle out of service S = SOYUZ P = PROGRESS
 SOYUZ Outcut

STS-130 KSC Milestone Interface Chart

OPR: USA - R. GILLETTE, INTEG. OPS.
NASA - C. FORD, PH-0

OV-105/24/ ISS-32-20A
CREW / DURATION: 6 / 12
ET 134/ BI141 / RSRM 109 / MLP-2/ PAD-A / VAB HB-3

SSP APPROVED OSB 3-10-09 (REF. CR #SO42013HT)
Status as of:
05/01/2009



THREATS: _____ NOTES: 1. THIRTY-SECOND ISS/SSP FLIGHT

Flight Element Processing

R. Goodman



Flight Element Processing Overview

- **OPF Flow Milestones** **Presented**
- **Processing Deltas** **Presented**
- **TPS Work Content** **Presented**
- **Issues and Concerns** **Presented**
- **Integrated Operations Summary** **Presented**
- **Configuration/Facilities** **Backup**



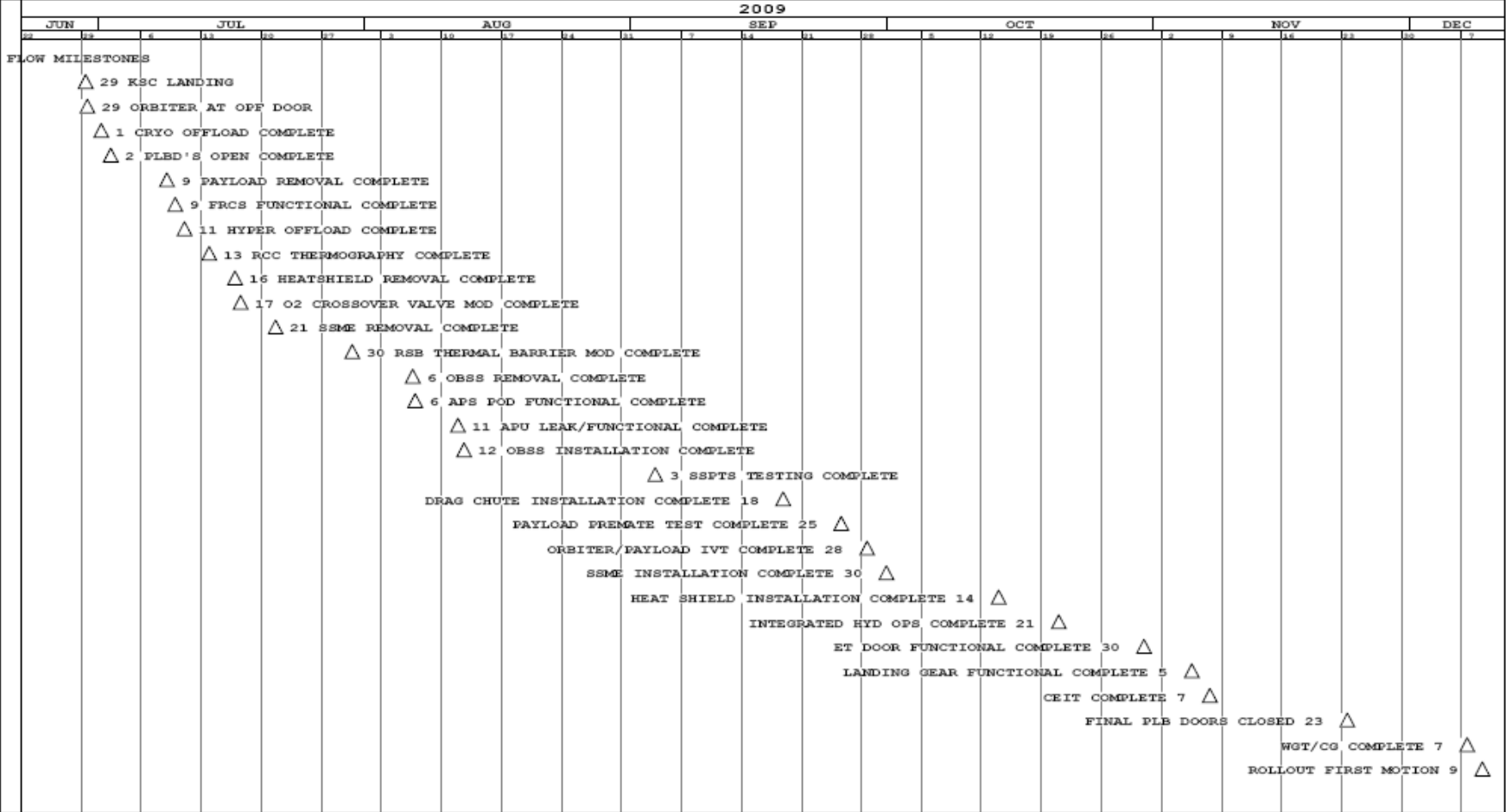
STATUS

USA	NASA
C	C
On/Offsite	ED/MSA-Industrial

STS-130/OV-105 OPF FLOW MILESTONES
 DOWN PAYLOAD: ISS-29-2JA / UP PAYLOAD: ISS-32-20A/NODE 3

Creation Date: 23-MAR-2009
 Revision Date: 11-MAY-2009
 Revision : A

OPR: USA-GOODMON, RANDAL D
 NASA-HUTCHERSON, DANA M



△ PLAN/BASELINE ◇ DEVIATION FROM BASELINE ▲ ◆ ACTIVITY COMPLETED △ ACTIVITY CANCELED △-△ ACTIVITY DURATION **** SCHEDULE CHANGE

STATUS DATE: 11-MAY-2009:1 PLOT DATE: 11-MAY-2009, 11.11 am NETWORK: OPF130.265 CONTACT: L.P. TUTEN ,1-0673 OPF BAY-2 EXE:CUSOPFSU.27



Processing Deltas

- **Mods:**
 - O2 Crossover Valve Talkback
 - RSB Inconel Thermal Barrier Redesign
- **CHITs:**
 - (J6495) MAGR-35 Link-008 Firmware Upgrade On Remaining Receivers
 - (J6507) Capture Output Wave Forms To Address Diode Concerns
 - (J6509) Removal Of MPS GH2 Flow Control Valves
 - (J6515) WLE Joggle Region IR Thermography
 - (Jxxxx) Node 3 Close Clearance Measurements
 - (Jxxxx) Midbody Lockbolt Inspection
 - (Jxxxx) Window Vespel Fasteners Torque Checks (Potential)



Processing Deltas (cont'd)

- **Time & Cycle:**
 - PPO2 Sensors Refurb
 - Hydrogen / Water Separator Refurb
 - Drag Chute Door Frame R/R

- **Deferred to Flight 24:**
 - MUX R/R
 - Window #2 R/R due to loose Rosan Fitting
 - Forward Airlock Hatch Equalization Valve (Cabin Leak Check)
 - Forward Starboard Radiator Retract Flexhose (Flight to Flight Inspection)
 - Window #8 Reapply Loctite
 - Startracker Door Re-torque Fasteners
 - Crew Module Closeout Panel Crack Repair
 - ECL Cabin Air ATCO Duct R/R
 - Av Bay 3A COM Coax Cable R/R



TPS Work Content

Projected TPS Removals (STS-130)

<u>Priority</u>	<u>Description</u>	<u>LSFR</u>
Mand	Deferred Tile/ Fib For 1 Flight (Minimum)	2
Mand	In-flight Tile/Blanket Damage (Estimate)	25
Mand	Operational Damage (Estimate)	20
Mand	Putty Repair Grindouts (Estimate)	14
Mand	Putty Repair Removals (Chit)	10
Mand	Corrosion Sampling	12
13	Nose Area 9lb/090 Sip Tile Upgrade	14
<u>BRI Implementation</u>		
10	MLGD Outboard Middle 1/3	21
12	MLGD Outboard Aft 1/3	23
TPS Removals TOTAL (Estimate)		*141

*** Final TPS Work Content Will Be Baselined At The Delta LSFR**



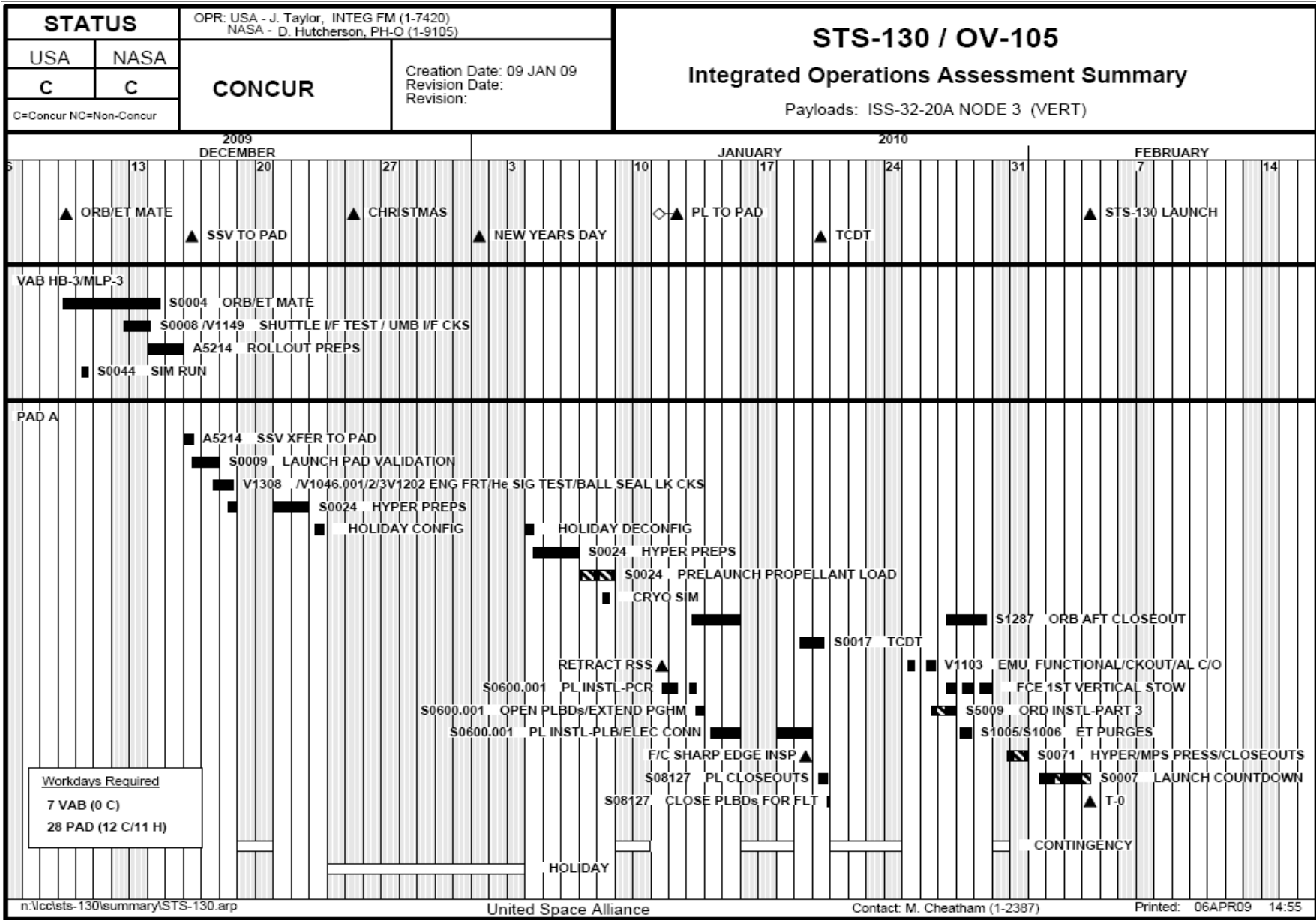
Issues and Concerns

- **High Work Content/Growth**

- Potential Problem Areas:

- Chin Panel (INS Fallout)
- FRCS F5R Leakage
- Forward Starboard Rad Retract Flexhose (Flt to Flt Inspection)
- Side Hatch Rigging
- RH Outboard Elevon Overtemp Structural Components
- RH T-0 Anti Rotation Bolt R/R
- FRCS Vernier Thruster Can Over Torqued Studs (Potential FRCS Removal)





n:\cc\lists-130\summary\STS-130 arp

United Space Alliance

Contact: M. Cheatham (1-2387)

Printed: 06APR09 14:55





STS-130 Launch Site Flow Review	Presenter Kenneth Nowak
	Date 05-21-09

Backup Material

FRWG Presentation (With Minor Changes)

Back-up

Modifications Matrix

MCR NO.	MCR TITLE	KIT/ MOD RECORD & DESCRIPTION	TECH ORDER IMPACT	REMARKS
<u>Mandatory Modifications to be Baselined at LSRR</u>				
30231	<u>Rudder Speed Brake Inconel Thermal Barrier Redesign</u> Installs the redesigned Rudder Speed Brake inconel thermal barrier tabs to improve strength of the tab attachment.	<u>TCTIV2930231REF, 0105, 0</u> - Installs redesigned RSB inconel thermal barrier tabs	No Tech Order Impact	No MECSLSI Impact
30250	<u>O2 Crossover Valve Signal Talkback Modification</u> Modifies Orbiter electrical configuration for the O2 crossover valves to provide valve position indication.	<u>TCTIV7930250REF, 0105, 0</u> - Repins the connector at the N2/O2 control panel and reworks the MDM and signal conditioners in the avionics bay	No Tech Order Impact	No MECSLSI Impact
	<u>Removal of Temp Sensing Labels on APU GN2 QD's</u> Removes temperature sensing labels on APU GN2 quick disconnects added on STS-127 flow to provide additional data on performance of added GN2 QD heater.	<u>S062831, 0105, 0</u> - Removes temp sensing labels on APU GN2 QD's installed on STS-127	No Tech Order Impact	No MECSLSI Impact

Open Mod Certification

STS-130 Open Mod Certification (as of 5/18/09)

- 6 open CRs/CARs (2 attrition CARs)

Document #	Part Name	CR	CAR	QSA	ERR	Subm to USA	PInd Apvl Date	Comments/Description of Change
34-07-190001-001Y	Wing TPS Installation (FRCI-12)		X			5/06/09A	5/22/09 (w/ OPO)	Replace LI-900 with FRCI-12 on V070-193018 0.090 SIP Tiles. Attrition change. Ref. TAD 30163R1.
07-290101-001S	External Insulation (RSB T/B)	X				5/29/09P		Certification for Rudder Speed Brake Inconel Thermal Barrier Tab Redesign. Ref. TAD 30231.
20-07-290101-001S			X					
25-849-660516-001P	Cushion Assy - Lightweight TSA	X				5/28/09P		Certification of the starboard LWTSA cushion to accommodate the contingency tools for STS-128. The change will also incorporate the port & starboard TSA cushions to be flown on STS-129.
16-25-849-660516-001P			X					
29-07-395001-001X	Aft Fuselage Insulation Installation		X			6/24/09P		Aft Stub Tile Upgrade. Upgrade to tile substrate for remaining LI-900 overhanging tiles on V070-395018 to AETB-8 on attrition basis. Ref. TAD 30261.

Open STS-128 Certs (affecting subs) = 2 (still to be submitted)
 Open STS-129 Certs (affecting subs) = 2 (still to be submitted)
 Open STS-130 Certs = None

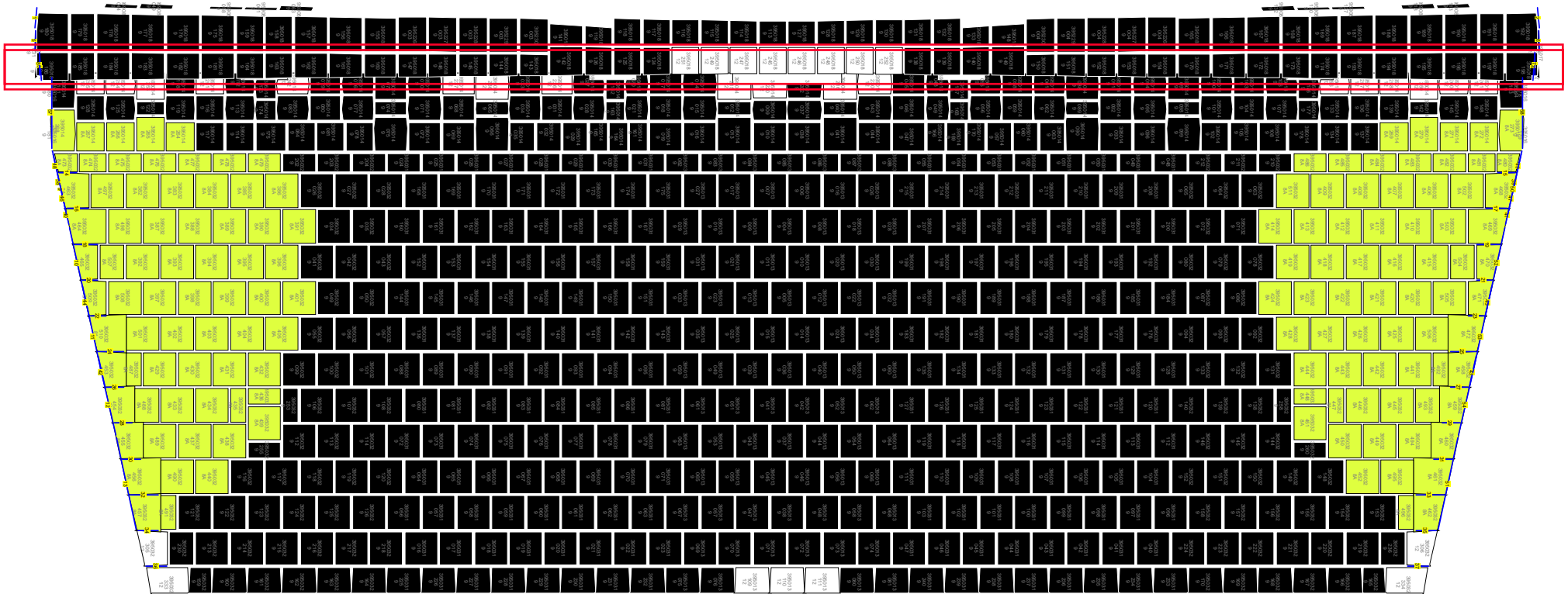
TPS Priorities - STS-130 LSRFR

UPDATED 2-18-2009 Bold indicates changes during STS-127 flow				
Priority Number	Total	OV-103	OV-104	OV-105
1. BRI-18 Tile - MLGD FWD O/B Corner	28	complete	complete	complete
2. BRI-18 Tile - MLGD FWD Edge	22	complete	complete	complete
3. BRI-18 Tile - MLGD O/B Side	18	complete	complete	complete
4. BRI-18 Tile - STR side of ET Doors	20	complete	complete	complete
5. BRI-18 Tile – LESS Carrier Panels 8-10 (103 & 104)	24	complete	complete	n/a
6. BRI-18 Tile – STR side of ET Doors I/B	8	complete	1	complete
7. Inboard Elevon “Hub” Tile Mod	4	complete	2	complete
8. I/B Elevon 9lb/90 SIP	34	complete	20	complete
9. O/B Elevon 9lb/90 SIP	6	complete	complete	complete
10. MLGD – Outboard Middle 1/3	24	0	0	3
11. ET Door remaining STR side	40	1	7	0
12. MLGD - Outboard AFT 1/3	24	0	0	1
13. Nose Area 9lb/90 SIP	14 (16 ^{OV103})	1	0	0
14. Base Heat Shield 9lb/90 SIP	42	8	complete	complete
15. Gap fillers in Subset 2B	5 Zones	2	1	0
16. Remaining BRI-18 - MLGD (top priority) / ET / LESS carrier panels / NLGD	MLGD 100	MLGD 0	MLGD 1	MLGD 0
	NLGD 123	NLGD 12	NLGD 19	NLGD 47
	LESS 68 (92 ^{OV-105})	LESS 7	LESS 5	LESS 19
	ET Door 28	ET Door 5	ET Door 0	ET Door 1
17. Mod work LESS internal	44 locations	38	39	complete
19. Remaining Gap Fillers & Window BRI-18	124	2	2	19
Structural Corrosion Sampling Plan	See Special Chart			
2nd Subset Putty Repair Removals	11 / 6 / 5	6	complete	complete

Upper Aft Stub Tile Change - Potential mod

Current OV-104 Upper AFT Stub/Body Flap Configuration (for reference only)

Affected Tiles in Red Box



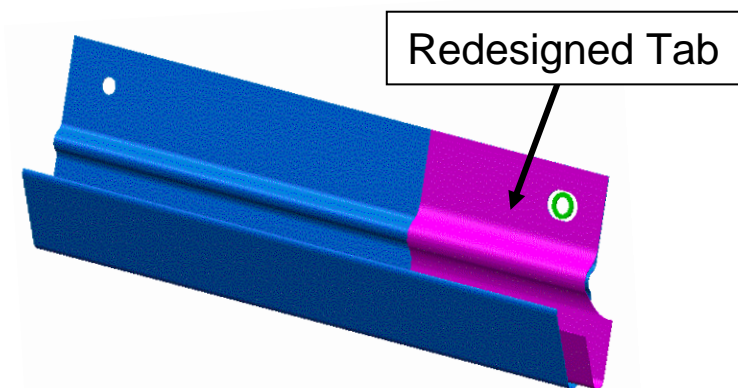
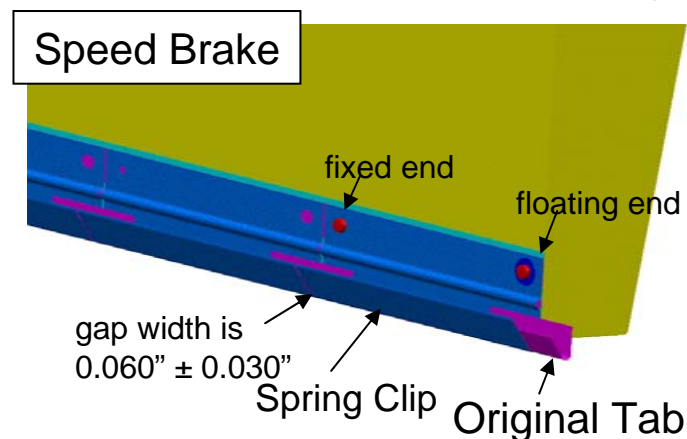
Yellow – AETB
Black – LI-900
White FRCI-12

STS-130 OV-105 Flight 24 - LSFR Baseline

The following modification was baselined at a previous review (LSRR)

- **TAD 30231 - Rudder Speed Brake Inconel Thermal Barrier Redesign**

- Installs redesigned Rudder Speed Brake inconel thermal barrier tabs to improve strength of the tab attachment
 - During STS-124 an inconel tab was seen floating away from the vehicle while on orbit
 - STS-126 post-flight inspection found 7 inconel tabs were missing, even though improved pre-flight ground inspection procedures were used
- The redesign effort will reduce the moment arm and stress to the spot welds, and will provide a secondary mechanical attachment
 - Redesign lengthens tab to reach screw, slides tab into spring by .70" (.30" overhang), includes more spot welds and changes the spot weld from Class "C" to Class "B" (additional quality control to ensure weld conformance)



STS-130 OV-105 Flight 24 - LSFR Baseline

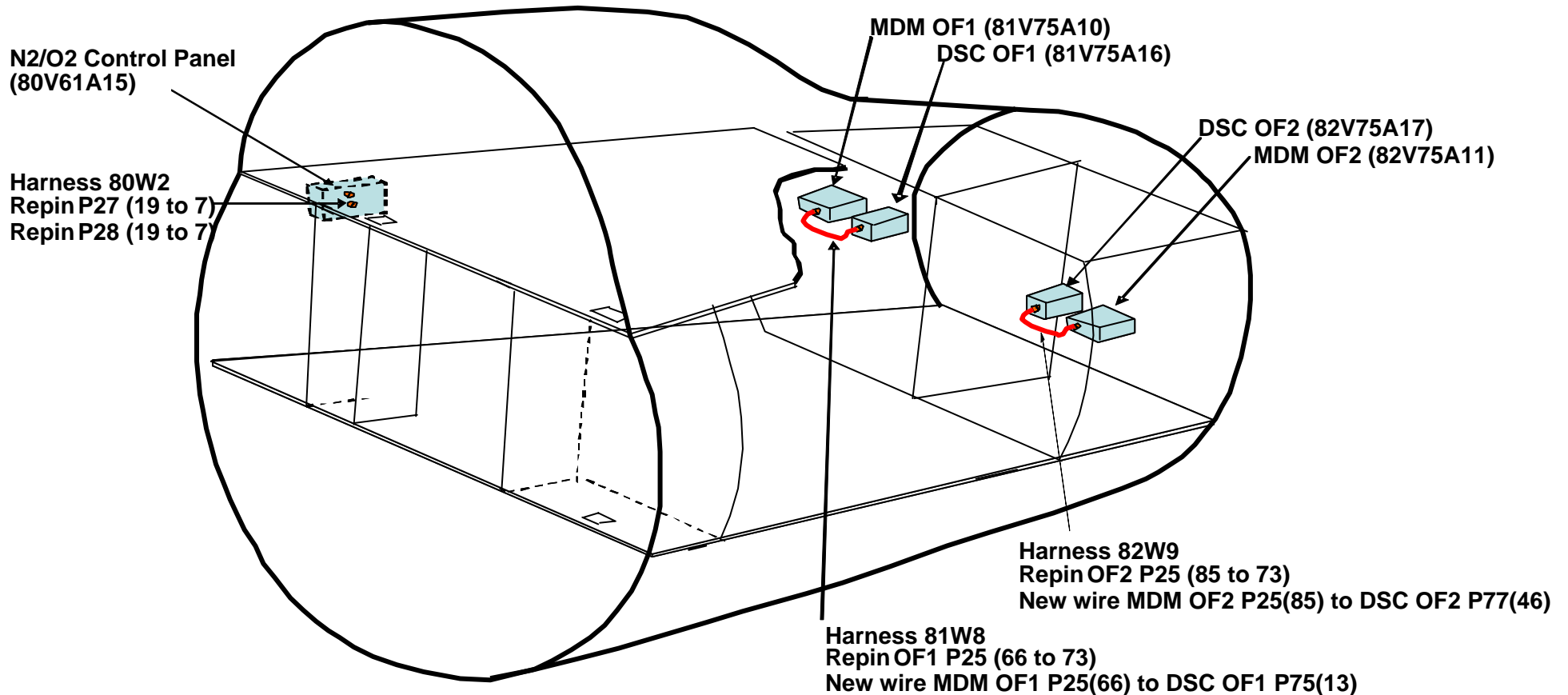
The following modification was baselined at a previous review (LSRR)

- **TAD 30250 – O2 Crossover Valve Signal Talkback**

- Modifies Orbiter electrical configuration for the O2 crossover valves to provide valve position indication
 - The N2/O2 control panel supports O2 and N2 flow to the crew cabin and provides O2 to the crew Launch Escape Suits (LES) and airlock
 - The O2 crossover valves are required to be open to support crew breathing on the Advanced Crew Escape Suit (ACES)
 - Current Orbiter configuration provides only switch scan instrumentation which verifies power applied to valve but not position indication
 - O2 crossover valve failure closed could result in the loss of oxygen to LES
 - The O2 crossover valve position indication is provided at the N2/O2 control panel electrical connector
 - Connecting to the available N2/O2 valve position will provide a reliable method for verifying that the O2 crossover valve is open
 - Electrical modification requires repinning the connector at the N2/O2 control panel and reworking the MDM and signal conditioners in the avionics bay
 - Provides visibility of valve position for ground monitoring only (LCC requirement)

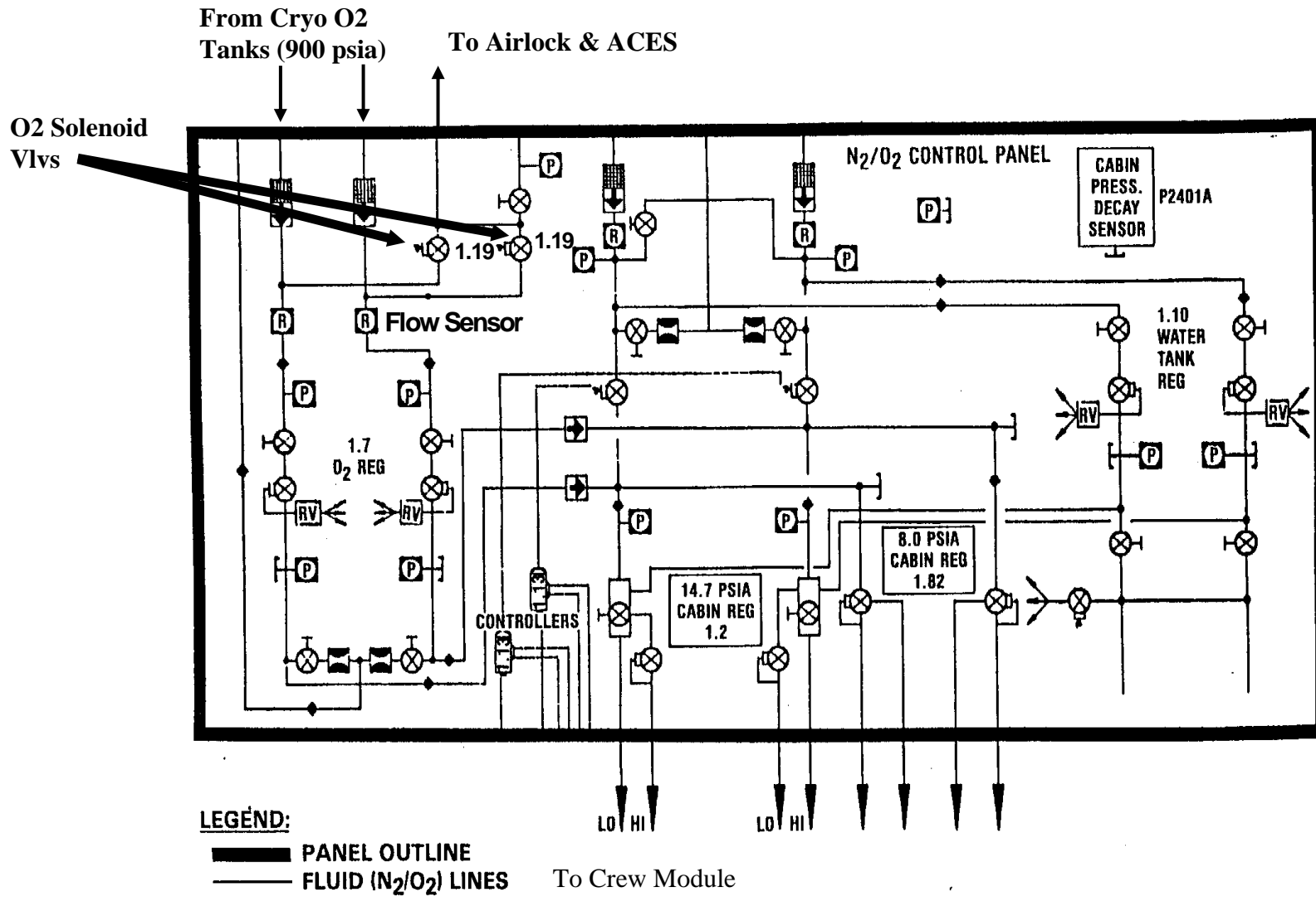
STS-130 OV-105 Flight 24 - LSFR Baseline

Overview of N2/O2 Control Panel & MDM/DSC's Wire Mods



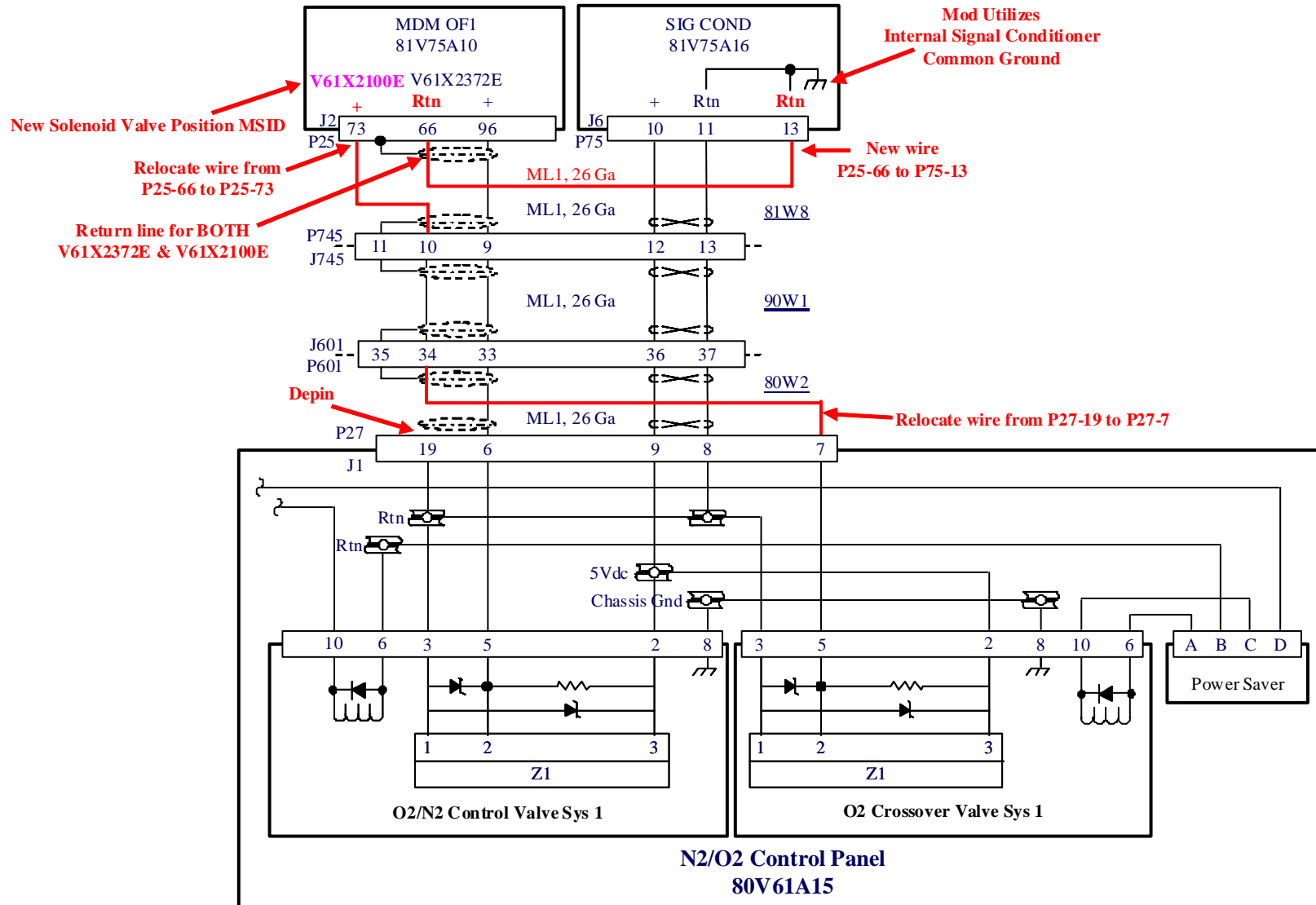
STS-130 OV-105 Flight 24 - LSFR Baseline

N2/O2 Panel Schematic



STS-130 OV-105 Flight 24 - LSFR Baseline

N2/O2 Control Valve System 1 Proposed Mod (System 2 Similar)

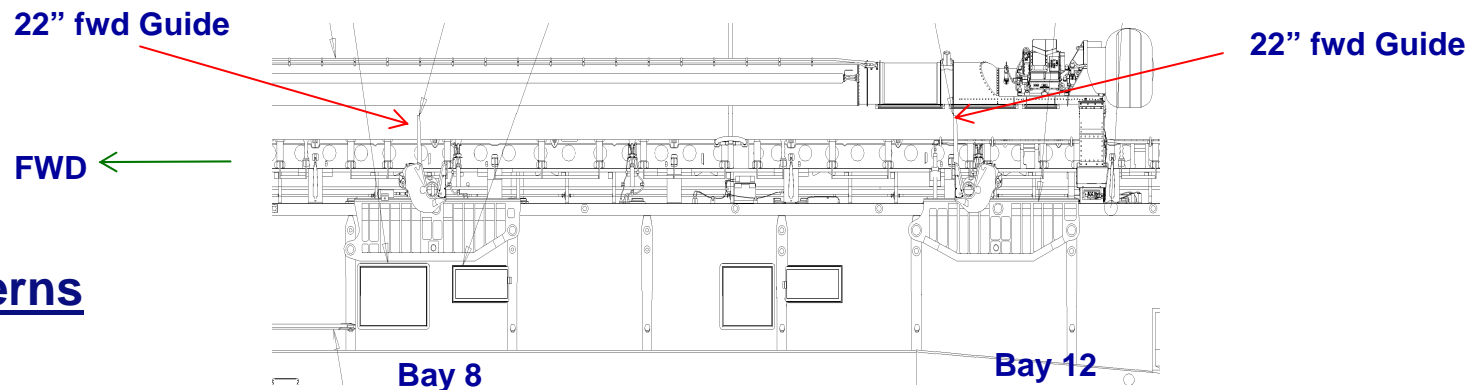


Cargo Engineering Backup

STS-130 LSFR

Cargo Integration Hardware Status

- No new Cargo Integration Hardware (CIH) is required for this mission
- Verified that bridges, latches, and CIH is available to support the latest SSP manifest dated April 2, 2009 for the following missions:
 - STS-128 (OV-103, FLT 37, 08/06/2009 LAUNCH)
 - STS-129 (OV-104, FLT 31, 11/12/2009 LAUNCH)
 - STS-130 (OV-105, FLT 24, 02/04/2010 LAUNCH)
- Latch guide allocation was verified (22" single guide in FWD position of each latch)



Issues/Concerns

- None

STS-130 LSFR

Payload ICDs/PIRNs

Payload-Unique ICD: ICD-A-21549-NODE3 is baselined

Open Work Affecting Engineering Flight Products

- Close Clearance Analysis and ICD Update
- Potential update per 04/24/09 CAD (PVGf added)

Issues/Concerns

- None

STS-130 LSFR

OMRSD

- **FII V2 Payload (Post-Mate)**

- RCNs

- PP17901 P1549 – ISS-20A Baseline

- Release

- 01/19/09A

- Baseline

- 05/29/09

- **FII V4 (Pre-Mate)**

- RCNs

- PS TBD S07 – STS-130 FII V4 MUL
 - PS TBD S07 – STS-130 FIII MUL
 - PS TBD S07 – STS-130 Adjacent Bent Pin Test

- Release

- 06/26/09

- 06/26/09

- 06/26/09

- Baseline

- 07/07/09

- 07/07/09

- 07/07/09

- **FII V6 (Shuttle Experiments) – None**

Issues / Concerns

- None

STS-130 LSFR

Annex 1: ISS-20A-NSTS 21549-A01

Activity	ECD
Baseline	02/12/09A
Post-CIR Update	
• Customer Submittal	05/22/09
• CR approval	06/09/09
L-4 Month Update	
• Customer submittal	09/14/09
• CR approval	10/05/09
L-1 Month Update	
• Customer Submittal	12/14/09
• CR Approval	01/04/10
• Final weight log	01/21/10
Issues/Concern	
•None	

STS-130 LSFR

TGHR Status

- Customer Submittal 10/05/09
- Release for Review 11/04/09
- Baseline 12/04/09

Issues/Concerns

- None

BACKUP



CONFIGURATION / Facilities

- **OV-105: Flight 24**
- **OMS Pods: LP03 / RP04**
- **ET: 134**
- **SRB: BI-1418/RSRM 109**
- **SSME: TBD(#1), TBD (#2), TBD (#3) U/R**
- **Payload: Node-3, Cupola**
- **Flight Software: OI-33**
- **Firing Room: 4**
- **OPF Bay: 2**
- **MLP: 2**
- **VAB High Bay: 3**
- **Pad: A**





STS-130 Launch Site Flow Review

Presenter
MK-SIO / A. Swift

Date **05-21-09** Page **1**

Mandatory RCNs:

NONE

Non-Mandatory Value Added RCNs:

NONE

STS-130

Launch Site Flow Review

Flight Software Overview

Tom Stansel
USA FSW

FRWG 05/18/09

PRCB 05/21/09

STS-130 LSFR (FSW)

- **STS-130/OV-105 Flight Software (FSW) Versions**
 - Third scheduled flight of Operational Increment (OI) 34 Flight Software (SASCB SCR 98107A documents PASS and BFS OI-34 content)
 - Third scheduled flight of MEDS IDP VI 07.00/MDUF VI 06.00 (SASCB SCR 98113 documents content)
 - Fourth scheduled flight of MAGRS-3S Link 613-996-008 Software (Link-008) (SASCB SCR 98115 documents content)
 - **STS-130/OV-105 Flight Software Payload Support:**
 - ISS 20A
 - Orbiter Interface Unit (OIU)
 - Sequential Still Video (SSV)
 - Orbiter Docking System (ODS)
 - Trajectory Control System (TCS)
 - ISS Caution and Warning (ISSCW)
 - Assembly Power Converter Units (APCUs) & Station to Shuttle Power Transfer System (SSPTS) (generic support for both configurations)
 - **Major New Flight Software Support Items:**
 - None
-

STS-130 LSFR (FSW)

- **STS-130 Source Changes/Edits for Primary Flight Software (Base)**
 - SCR 92882 Allow Three String GPS for STS-116 and Subsequent OV-105 Flights
 - SCR 93211A Update of SSMEC Vehicle Data Table (VDT) for Enhanced Accelerometer
 - SCR 93262A Film ET Camera
 - SCR 93267A Removal of the Set and Reset to False Cmds For the RCS Tank ISO Valves
 - DR 126366 SM GPC Failure to Send GCIL Commands
- **STS-130 Patch Implementation for Primary Flight Software**
 - None
- **STS-130 Patch/Edit Implementation for Backup Flight Software (Base) (included on delivered Mass Memory)**
 - None
- **STS-130 Patch Implementation for Backup Flight Software**
 - None

STS-130 LSFR (FSW)

- **Products**

- **STS-130/OV-105 Base delivery schedule (available to field)**

FPSB

- **Shuttle Data Tape**
 - **Mass Memory Unit**

May 29, 2009

June 16, 2009

- **Open Items**

- **None**

- **Concerns/Issues**

- **No issues or concerns with STS-130 at this time**



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Orbiter Project Office

NASA Johnson Space Center, Houston, Texas



STS-130 LSFR FLIGHT CREW EQUIPMENT/GFE	Presenter Kenneth Brown	
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STS-130 LSFR FCE/GFE Status

Kenneth Brown
Manager, GFE & Flight Crew Equipment Office
Johnson Space Center



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- Delivery dates partnered at STS-130 Cargo Integration Review
 - Delivery dates shown are already delivered h/w or transferred from STS-128



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BACKUP



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STS-130 LSFR FLIGHT CREW EQUIPMENT/GFE

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Hardware	Tech Order	Cert O/C	KSC Need	JSC Planned	JSC Remarks	JSC Contact
A (port forward)	M072-750025-080	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
B (port aft)	M072-750025-081	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
C (starboard aft)	M072-750025-082	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
D (starboard forward)	M072-750025-083	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
SRMS elbow camera	M072-544504-009	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
SRMS wrist camera	M072-544504-010	O	10/09/09	10/09/09	H/W from STS-128.	Randall Moore
Centerline Airlock Camera (stowed)	M072-660828-002, CCCD	C			Installed	Randall Moore
Lefthand Umbilical Camera (aft)	M072-705001-016	C	12/07/09	12/07/09		Randall Moore



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STS-130 LSFR FLIGHT CREW EQUIPMENT/GFE

Presenter
Kenneth Brown

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Hardware	Tech Order	Cert O/C	KSC Need	JSC Planned	JSC Remarks	JSC Contact
Righthand Umbilical Camera	M072-705001-028	O	12/07/09	12/07/09		Randall Moore
Digital Television (DTV)	M072-710570-007	C			Installed hardware.	Randall Moore
MCIU/RMS Situational Awareness Display (RSAD)	M072-710543-001	O			Installed hardware.	Larry Schmidt
Portable Foot Restraint (PFR)	M072-661568-029	C	10/20/09	10/20/09		Sandy Peterson
Tools for Rendezvous and Docking (TRAD)	M072-730021-020	O			Installed hardware.	Larry Schmidt
Tool Stowage Assembly (TSA)	M072-660853-002 M072-660850-005	C	10/23/09	10/23/09		Sandy Peterson
Video Processing Unit (VPU)	M072-710338-007	C			Installed hardware.	Larry Schmidt
Winches	V070-650007-085	C			Installed hardware.	Sandy Peterson



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STS-130 LSFR FLIGHT CREW EQUIPMENT/GFE

Presenter
Kenneth Brown

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Hardware	Tech Order	C e r t i f i c a t e d	KSC Need	JSC Planned	JSC Remarks	JSC Contact
Wireless Video System (WVS)	M072-744007-001 UHF M072-344828-001 mount M072-744004-012 S-BAND M072-744004-013 S-BAND M072-744004-014 S-BAND M072-744004-015 S-BAND M072-744004-016 S-BAND M072-744004-017 S-BAND M072-744004-018 S-BAND	C			Installed hardware.	Randall Moore
Space to Space Orbiter Radio (SSOR)	M072-344828-002 M072-740828-002 antenna	C			Installed hardware.	Larry Schmidt
RMS Sideview Camera (RSC)	M072-710281-002 M072-000416-006 camera	C	1/08/10	1/08/10		Randall Moore
Wing Leading Edge (WLE) Instrumentation - Left Wing**	M072-756111-007	O			Installed hardware.	Michael Wright
Wing Leading Edge (WLE) Instrumentation - Right Wing**	M072-756111-008	O			Installed hardware.	Michael Wright
SCU	M072-661606-012	C			Installed hardware.	Sandy Peterson
OBSS Sensor Package 1	M072-710282-008		10/01/09	10/01/09		
OBSS Sensor Package 2	M072-710282-006	O	10/01/09	10/01/09		Larry Schmidt
Airlock Adapter Plate	SJD32101440-032	O			Installed hardware.	Sandy Peterson

EVA Status STS-130/20A Launch Site Flow Review

**David Foltz
EVA Office
Johnson Space Center
May 21, 2009**

- **Forward Bulkhead PFR**
 - Portable Foot Restraint, SED33105308-307 installed on forward bulkhead.
 - Released T.O. M072-661568-029
 - Required to protect for contingency EVA TPS inspection
- **Lightweight Port TSA**
 - Port LWTSA installation – Tech Order: M072-660850-005
 - Port LWTSA Tools installation – Tech Order: M072-660853-002
- **No Starboard TSA**
- **Winches**
 - Winch P/N SED33101570-327 on Forward Bulkhead
 - Winch P/N SED33101570-325 on Aft Bulkhead

STS-130 Launch Site Flow Review

20A STS-130 Node 3/Cupola

KSC ISS & Spacecraft Processing

Joseph T. Delai, NASA, KSC Mission Manager
Dave Cormack, Boeing, KSC Flow Manager

May 18, 2009



Planned Processing Milestones

PRE-SHUTTLE INTEGRATION ACTIVITIES

Space Station Processing Facility:

Thales Alenia Space Italia (TAS-I) processing:

- Node 3 arrival 05-20-09
- Node 3 ammonia load 06-17-09
- Cupola to Node 3 mate 07-16-09
- CEIT 09-10-09 to 09-16-09
- Preliminary ICD Walk down 10-22-09
- Node 3 turnover (from ESA/TAS-I to NASA) 10-30-09

Boeing-CAPPS processing:

- ISP stowage integration 11-16-09 to 11-25-09
- Hatch Closure 12-07-09
- Final ICD Walk down 12-12-09
- Transfer to Canister 01-09-10



Planned Processing Milestones

SHUTTLE INTEGRATION ACTIVITIES

Orbiter Processing Facility:

- None

PAD:

- | | |
|----------------------------------|--------------|
| • Payload to Pad | 01-12-10 U/R |
| • Payload installed into Orbiter | 01-18-10 U/R |
| • Payload IVT | 01-20-10 U/R |
| • Payload Closeouts | 01-27-10 U/R |
| • LAUNCH | 02-04-10 |



KSC/ISS Processing Summary

Watch Items:

- No current watch items.

The KSC STS-130/20A - ISS Mission Processing Team is ready to proceed with processing the STS-130 Mission payload complement.





STS-130 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-21-09**

Backup Material

- **SSP Systems Drawings** Attachment 1
- **SSP Authorized Modifications/Non-Standard Work** Attachment 2
- **SSP OMRS Waivers and Exceptions** Attachment 3
- **Launch Window** Attachment 4
- **Open Configuration Waivers** Attachment 5



STS-130 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-21-09**

SSP System Drawings

The Drawings Baseline Was Released By PRCB S115130 on TBD

- V072-000001-284 (Rev. TBD) Space Shuttle System (Rel. TBD)
 - V072-200210-001 (Rev. NEW) Mission Equipment Cargo Support (Rel. 02-27-09)
 - SGD32104453-501 (Rev. NC) Crew Compartment Configuration (Rel. 05/11/09)
 - 502 Descent
 - V070-000001-005 Orbiter General Assembly
 - V070-410100-018 SSME Installation
 - 10100-0061-178 Integrated SRB General Assembly (BI-141)
 - 80901000000-530 External Tank Assembly (ET-134)
- STS-130 LSRR + 18 days Mission Configuration Product Plan (MCP) was last published on 05-11-09 and will be republished at ORR -14 days on TBD.



STS-130 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-21-09**

SSP System Drawings – (Continued)

Ferry Configuration

- **V072-000001-285** (Rev. TBD) Space Shuttle System Drawing (Rel. TBD)
- **V072-200210-002** (Rev. NEW) Mission Equipment Cargo Support (Rel. 02-27-09)
- **SGD32104453-001** (Rev. NC) Crew Compartment Configuration (Rel. 05/11/09)
- **V072-300055-028** (Rev. BU) Ferry Flight Configuration (Rel. 05/11/09)

SCA 905

LW MAR
SJD32108929-TBD

CDR GEORGE ZAMKA
PLT TERRY VIRTS
M/S #1 KATHRYN HIRE
M/S #2 STEPHEN ROBINSON
M/S #3 NICHOLAS PATRICK
M/S #4 ROBERT BEHNKEN

MODULAR LOCKER LAYOUT ASCENT

PANTRY FOOD (SNACKS) 1622 -308	MF57A PANTRY FOOD (UTENSILS) 1622 -308	PANTRY FOOD (BEVERAGES) 1622 -302
--------------------------------	--	-----------------------------------

LEADER: MELISSA BANDA
DATE: 05-04-09
LAUNCH: 02-04-10
FLIGHT: STS-130/20A NODE 3
VEHICLE: OV-105
CREW: 6 MAN 12 + 1 + 2 DAYS
RQMTS: TEPC, ERGOMETER,
GALLEY
SLEEPING BAGS

ML60B 6013 -310
PRIME C/L CAM
GFE TV CONTROL

ML60E 0646 -TBD

STS1=OCA
STS2=WINDECOM
STS3=KFX
STS4=WLDMAP
STS5=RPOP
STS6=WLES
PGSC ACCESS
ACCESS PT
 PCS LAPTOP
60GB HD

ML60M 6014 -312
B/U C/L CAM
ULTRA SONIC
LEAK DETECTOR

VOL B (MA73J) 7436 -TBD
HYGIENE

VOL 3B (MA73J) 7425 -326
QUICK DON MASK(3)
CABIN AIR CLEANER
SPOTLT/D2XS CAM
12-24MM
G1 CMCR
400MM LENS

MIDDECK FORWARD

MF14E 2760 -306 FRESH FOOD	MF28E/G 7493 -301 GLACIER
MF14G TBD -308 MENU FOOD	MF28H 6684 -TBD MED KITS ALTIMETER
MF14H 2763 -304 MENU FOOD	MF28K 2764 -306 MENU FOOD
MF14M 0693 -TBD HRM(2) NH3 DETEC KIT SALIVA/BLOOD KIT SOMS RESUS	MF28M 2765 -304 MENU FOOD
MF14O 5452 -327 IFM BREAKOUT BOX TURNBUCKLES AIR SAMPLERS WWD FILTER RMS KIT	MF28O 2766 -305 MENU FOOD

MF43C 1900 -308 CDR CLOTHING	MF57C 8047 -304 DC VAC (CTB)	MF71C 1901 -305 PLT CLOTHING
MF43E 5473 -305 ORBITER FDF	MF57E 6240 -311 ORBITER FDF SODF (ZIPLOCK)	MF71E 7497 -303 * CGBA
MF43G 1902 -308 M/S #1 CLOTHING	MF57G 6291 -311 SODF (CTB)	MF71G 1903 -305 M/S #2 CLOTHING
MF43H 8967 -TBD MAK/MINERAL KIT CRYO GLOVES SAMPLE PURGE KIT SILVER BIO KIT(2) PRINTER PAPER	MF57H TBD WATER KIT CREW CARE PKG	MF71H 0298 -301 PWR (CTB 8852-302)
MF43K 2769 -309 MENU FOOD	MF57K 7979 -TBD ISS PHOTO/TV KIT (CTB)	MF71K TBD ISS CHECS (CTB)
MF43M TBD -TBD MENU FOOD FRED	MF57M 8965 -TBD YELLOW HOSE CONDENSATE CWC(2) SUPA(13) DOCK MECH KIT STS CSA-CP	MF71M 3005 -304 M/S #4 CLOTHING
		MF71O 6697 -335 HH LIDAR W/NIGHTSCOPE 2ND HHL (TRAD)/SSV/BPSMU

MIDDECK AFT

MA9D/F 9882 -TBD TRAD LIOH OBF	MA16D 1904 -307 M/S #3 CLOTHING
MA9G 8737 -311 RCC COLD BAG ASSY	MA16F 6250 -353 IFM TOOLS 2163-302 2161-305 2162-307 MULTIMETER
MA9J 8719 -309 COLOR PRINTER & PAPER (CTB 6066-334)	MA16G 6299 -321 COAS/WORK LIGHT SHIELDS/D2XS AUDIO DOSIMETER BTA
MA9L 6269 -309 PRINTER TRAYS IODINE REMOVAL 6256-306	MA16J TBD -301 ISS RESERVE
MA9N 7432-TBD SOFT STWG BAGS PHKS(6) 4980-309 COK/LIGHT STICKS/COMM PHK 8071-312 RSTENTS/FLUID LD FIBERSCOPE 8070-303	MA16L 8723 -302 PHOTO/TV STOW&GO (CTB)
	MA16N 1908 -309 CREW SUPPORT

MD CEIL (PORT 1) TBD -301 JUMPER ASSY(2)	MD CEIL (PORT 2) 0704 -TBD LCVG(3)/DIBB LCVG W/BDMED ECOK/WAIST TETH(4) COMM CARRIER(2) PHASE VI GLOVE(4PR) ENTRY GARMENTS
MD CEIL (STBD 1) TBD -301 JUMPER ASSY(2)	MD CEIL (STBD 2) TBD -301 JUMPER CABLES(7) JUMPER HYGIENE NADA CHAIR
MD FLOOR (PORT 2) TBD -301 DUCT ASSY(2)	MD FLOOR (PORT 1) TBD -301 AXIAL PORT SHIELD
MD FLOOR (STBD 2) TBD -301 IPT RESERVE FIRE EXT/COVER ASSY JUMPER ASSY(6)	(L-10 BR) MD FLOOR (STBD 1) TBD -301 ISS RESERVE

A16 7490 -305
PGSC DESK(3)
CAM BAG
PILOT HC
BOGAN ARM(3)

A17 7424 -304
CORE CC BAG
DTV CAMERA BAG
QUICK DON MASK(4)
HATCH TOOL

VOLUME D (MD52C) 7498 -301
RCC REPAIR HDWR
B/U DTV HDWR

VOLUME F (MD76M) 1403 -306
WET TRASH

VOLUME G (MD88R) 1800 -346
CONT UCDS
WASTE MGMT
CWC(2)

VOLUME H (MD23M) 8068 -319
EMU SERVICE KIT
EHIP BATT(4)
(INBD)
EVA ACCESS (OBD) 8065 -313

WMC (MA82V) 0914 -332
TOWELS AND
RESUPPLY ITEMS
WMC DISPENSER
1st DAY CLOTH
SUPA(1)
1641-330

EXT AIRLOCK 5555 -TBD (STBD)
2-EMUs (PORT)
EXT A/L FLOOR 0289 -TBD
SAFER/TORQUE WRENCH
AET(6)/SAFER HCM
TRASH BAG/BRT/MWS
CCC(4)/85' TETH(2)
RETS(1) EMU BATT

32 LIOH: 29 + 1 ATCO IN LIOH BOX, 2 INSTLD,
1 IN MA9D/F
G-SUITS(6)
(7435-TBD)

WINDOW SHADE BAG - WINDOW SHADES
(5548-369)
IFM CABLES & HOSES (4259-344)
MONITOR SHIELDS/OCA CABLE

L10A1: AVIU/MPC (6686-TBD)
L10A2: DTV MUX
L10A3: DTV VTR/VIP
L11: PDIP 2 OIU 1/2
L12A1: SSP 1
L12A2: SSP 2
L12A3: PDIP 1
R12A1: VPU
R12A2: OBSS/OPP

* NOT APPROVED
LATE LOAD
SWAP
TRANSFER TO ISS
CTB-CARGO TRANSFER BAG
HCTB-HALF CARGO TRANSFER BAG

C/D JSC TBD
P/D JSC TBD
C/D KSC TBD
P/D KSC TBD
CEIT KIT TBD
MDK LBL TBD
DWG NO. SGD32104453
/USR/DWGS/LOCKER/STS130
CCMM: M. McDONALD 483-1384



STS-130 Launch Site Flow Review	Presenter Kenneth Nowak	
	Date	05-21-09

Modification Impact Report

- **Mission Equipment Modifications and Orbiter Modifications analyzed for impacts to OMRSD, LCC, ICD, EMI, Software, and GSE.**
- **A total of 3 MCRs have been approved and/or pending mods**
- **Current MCR impact status:**
- **No impacts for all six disciplines** **1**
- **One or more disciplines with impacts, documentation approved and/or pending approval** **0**



STS-130 Launch Site Flow Review

Presenter **Kenneth Nowak**

Date **05-21-09**

Modification Impact Report – (Continued)

- **Possible impacts still under review** **2**
 - **MCR 30231 is being reviewed for OMRSD and GSE impacts**
 - **MCR 30250 is being reviewed for all impacts**

1MRC5 REPT. 4650-1
PAGE NO. 1

SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0130

ORB

ECP-MCR/KIT SEQUENCE

RUN TIME

09:57 DATE 05/12/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
S-J6275A	AUTH	J6275A	0105 002	ORBITER STRUCTURE IML SURFACE CORROSION SAMPLING INSPECTION
2008-02-26	MAND			
	KSC		SPAR	CORROSION SAMPLING CAPABILITIES WILL BE PROJECTED AT LSFR,
	024			AND FINALIZED AT DLSFR FOR EACH FLOW.
S-J6379	AUTH	J6379	0105 000	OV-105 BODY FLAP PDU GEARBOX FLUID LEVEL INSPECTION
2008-07-15	MAND			
	KSC		SPAR	
	024			
S-J6414A	AUTH	J6414A	0105 001	RUDDER SPEED BRAKE THERMAL TAB INSPECTION
2008-12-19	MAND			
	KSC		SPAR	
	024			
S-J6495	AUTH	J6495	0105 000	MAGRS-3S LINK-008 FIRMWARE UPGRADE ON REMAINING RECEIVERS
2009-05-08	MAND			
	KSC		SPAR	MAGR FIRMWARE UPDTS ARE INTEG'D IN PLANNED OV-105 STS-130
	024			OPF PROCESS'G FLOW. FIRMWARE AUTH'D BY SSP
S-J6507	AUTH	J6507	0105 000	CAPTURE OV-105 OUTPUT WAVEFORMS TO ADDRESS 1N3600 DIODE CONC
2009-05-12	MAND			
	KSC		SPAR	ERNS
	024			
S062831	AUTH	S062831	0105 001	REMOVAL OF TEMP SENSING LABELS ON APU GN2 QD'S
2009-04-15	MAND			
	KSC		NASA	
	024			

030231	AUTH	TCTIV2930231REF	0105 000	RUDDER SPEED BREAK INCONEL THERMAL BARRIER REDESIGN
S115130A	MAND			
	KSC	NOT REQUIRED		ADDED BY EDS I/F & V070-298115 A07
2009-05-07	024			
030250	AUTH	TCTIV7930250REF	0105 000	02 CROSSOVER VALVE SIGNAL TALKBACK
S115130A	MAND			
	KSC	NOT REQUIRED		ADDED BY EDS I/F & V070-778502 A23
2009-05-07	024			

TOTAL MODS = 8

1MRC5 REPT. 4650-1
PAGE NO. 2

SSP SUMMARY MOD ITEMS - PRCBD MOD BASE LINE STS-0130

SRB

ECP-MCR/KIT SEQUENCE

RUN TIME

09:57 DATE 05/12/2009

PRCB	STAT	ITEM/KIT NUMBER	SEQ	
MCR/ECP	PRI0	TCTI NUMBER	EISN NO.	DESCRIPTION / GENERAL REMARKS
AUTHDATE	SITE			
	FLT			
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
S171478	PLND	FEC RSRM-120	B141 000	STIFFENER RING FOAM BONDLINE VERIF PULL-TEST LOCATION CHANGE
2009-04-22	KAS		NASA	
TOTAL MODS =		1		

Approved STS-130 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	EISN PAYLOAD	STS BEG END	
+	E	ORB	S053299TQ EK10696 (A)	OMRSD EXCEPTION REQUEST - FUEL CELLPOWERPLANT 1 H2 FLOWMETER LOWE RLIMIT (EK10696)	105	023 027
		SSME	S053298HG EK10501 (A)	OMRSD EXCEPTION REQUEST - SSME HE BARRIER SYSTEM INFLATION EXCEPT ION(EK10501)	2056	005 005
	W	ET	S053293FZ WK03850R1 (A) (STS-093)	L02/LH2 TANK PRESSURE MONITOR FOR MOVE	ET	099 999
		OMS	S053294ZV WK10093 (A)	OMRSD WAIVER REQUEST - OMS HEATER RESISTANCE (WK10093)	0024	024 031
			S053299HG WK10648R2 (A)	OMRSD WAIVER REQUEST - LEFT OMS PODHELIUM ISOLATION VALVE INTERNA L LEAK(WK10648R2)	0013	033 036
		ORB	S053296LJ WK10240 (A)	OMRSD WAIVER REQUEST - WSB 2 GN2 REG PRESS BELOW OMRSD (WK10240)	105	018 026
			S053298TA WK10538 (A)	OMRSD WAIVER REQUEST - MODULAR AUXILIARY DATA SYSTEM FREQUENCY DI VISIONMULTIPLEXER 1 FREQUENCY CALIBRATIONOV- 105 (WK10538)	105	020 026
			S053298TB	OMRSD WAIVER REQUEST -	105	020 026

WK10540	(A)	MODULAR AUXILIARY DATA SYSTEM FREQUENCY DI VISIONMULTIPLEXER 2 MUX CH. 1 DATA SHIFT OV-105 (WK10540)		
S053299DQ		OMRSD WAIVER REQUEST -	105	021 026
WK10614	(A)	MODULAR AUXILIARY DATA SYSTEM FREQUENCY DI VISIONMULTIPLEXER-M1A, NOISE RATIO/NOISE LEVEL (WK10614)		
S053299HE		OMRSD WAIVER REQUEST -	105	022 025
WK10639R1	(A)	AUXILIARY POWER UNIT 1 GAS GENERATOR CHAMB ERPRESSURE BIAS (WK10639R1)		

Approved STS-130 OMRS Waivers and Exceptions

WVR EXC	ELEMENT PROJECT	PRCBD NUMBER WAIVER# (STAT) (INITIAL STS)	ABSTRACT RAS REQUIREMENTS	STS EISN PAYLOAD	BEG END	
+	W	ORB	S053299LM WK10655 (A)	OMRSD WAIVER REQUEST - FUEL CELL POWER PLANT CELL PERFORMANCE MON ITORSTACK DELTA VOLTAGE 1 AT 510 MILLIVOLTS (WK10655)	105	022 025
			S053299QE WK10684R1 (A)	OMRSD WAIVER REQUEST - FRCS FUEL CELL CHECK VALVE 101 ELEMENT #3 FAILEDLEAK CHECK (WK10684R1)	105	023 025
			S053299TT WK10697 (A)	OMRSD WAIVER REQUEST - AIRLOCK FWD HATCH PORT EQUALIZATION VALVE LOWTORQUE (WK10697)	105	023 025
	RCS		S053296PV WK10275 (A)	OMRSD WAIVER REQUEST - RRCS FUEL A& B LEG REG LOCKUP PRESSURE(WK 10275)	0024	026 034
	SRB		S053293WA WK03886 (A) (STS-103)	LH FWD AND RH MID SRB JOINT TEMP SENSORS	BI	099 999

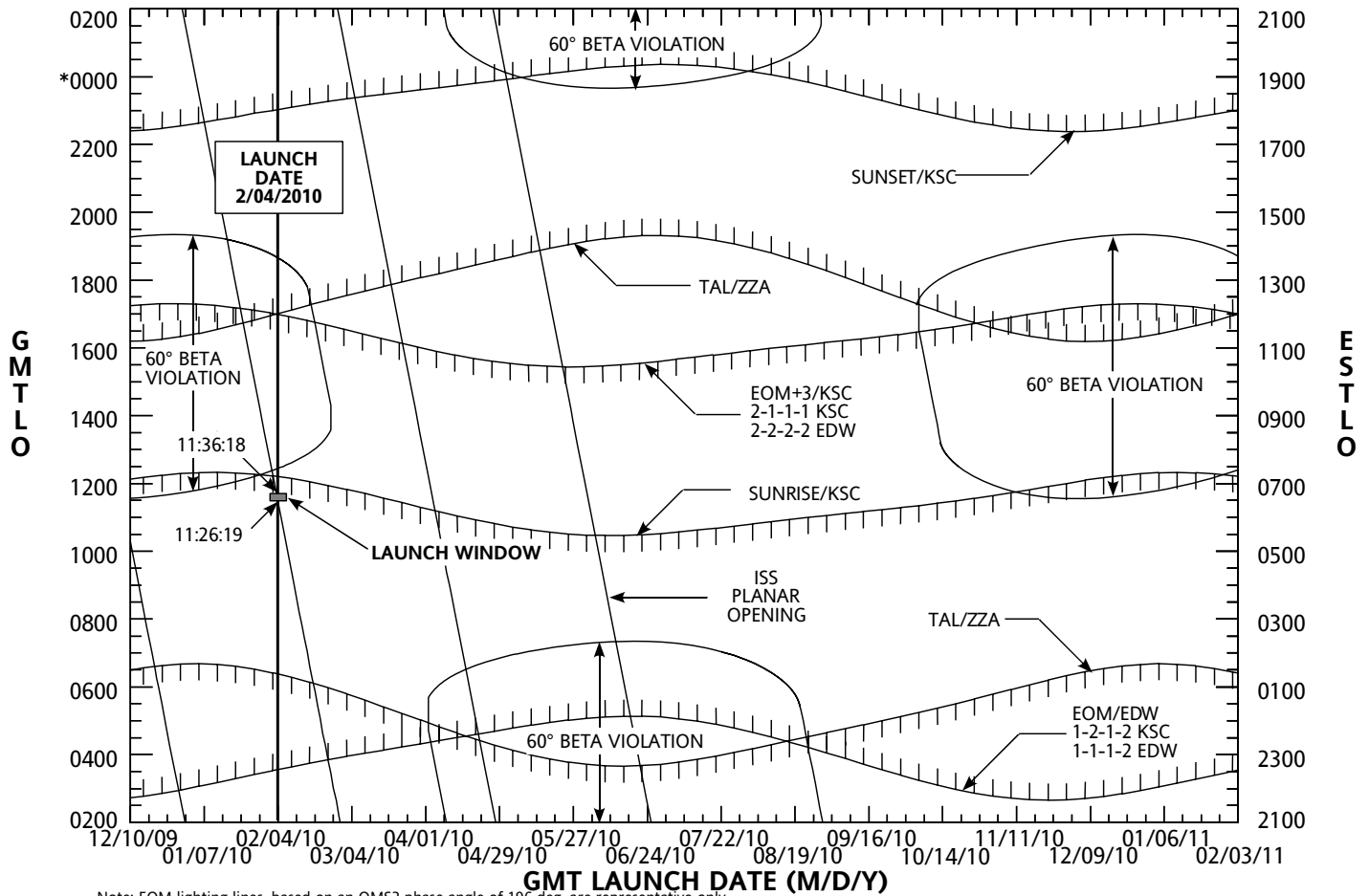
+-----+-----+-----+-----+-----+-----+						
	Waivers	Except	Deviat	Cannib	Total	
o	o	o	o	o	o	o
o Total Extracted	o 13	o 2	o 0	o 0	o 15	o
+-----+-----+-----+-----+-----+-----+						

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Mission Duration = 12+1+2
 Inclination = 51.6°
 OMS2 ha/hp = 124 x 85 nmi.
 Target ha/hp = 194 x 185 nmi.

C. Oliver/USH-483L
 P. Gentry/USH-483L
 December 12, 2008

STS-130 CFP LAUNCH WINDOW



Note: EOM lighting lines, based on an OMS2 phase angle of 196 deg, are representative only.
 The ISS beta angle ($|\beta| < 60^\circ$) for mated operation is beginning ~ 1/20:59:13 MET (FD3 Rendezvous) and ending ~ 10/15:19:00 MET
 * indicates the dateline. Launch times above this point are on subsequent days from the date indicated on the corresponding date axis.

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad
53	S052428A	03/27/91	Allows specified flights to fly with interim TPS repair after each mission to minimize damage to surrounding tile during ferry flight	STS-37, STS-39, STS-40, STS-42 thru STS-999	STAYS OPEN
101	S076972	11/19/91	Permit the modified GPCs (AP101-S) Battery Back-up Unit to fly with annotated fastener improvements without rolling the LRU Part Number	STS-42, STS-44, STS-47 and STS-49 thru STS-999	STAYS OPEN
341	S063701	08/07/07	<p>The following requirement is waived to allow OV-105 to fly with the following out-of-configuration condition:</p> <p>Partial installation of Tech Order M072-660010-004, Middeck Air Flow Re-routing Duct Tech Order, not to include bolt (NAS1003-8A) and washer (NAS620C10) in the lower aft corner of the vent housing cover assembly.</p> <p>During vertical stowage the nut plate (not under USA Tech Order configuration controlled) was noted missing from behind the starboard closeout panel. Without the nut plate, the bolt and washer cannot be installed. The area cannot be currently accessed to re-install the missing hardware. (NOTE: MRB in work on PR FCS-5-20-0476 to approve use of tape on the open hole. Lost and found PR LAF-5-20-0440 written to document lost nut plate.</p>	OV-105, Flight 20	

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad
344	S071024MP	12/20/07	<p>During maintenance of an Advanced Master Events Controller (AMEC) it was discovered that the module cards are able to translate upward, away from connectors. The cards are retained by friction applied by wedge-locks. An assessment determined a 0.070 upward card translation, would result in card disengagement from connectors. The wedge-lock system can not assure the cards will not translate upwards. The AMEC vendor (Boeing Autonetics) is no longer on contract supporting SSP. A design proposal is to provide a secondary connector retention using the AMEC covers. The new design new lids will limit the upward translation to 0.055. The new design will reduce the milled section of the cover and add silicone pads to provide shock absorption. Due to the absence of the original vendor and no current alternate drawings available for the AMEC the modification is being requested via a program directed Material Review (MR).</p> <p>P/N MC450-0016-0029</p> <p>S/N U6F0002, U6F0003, U6F0004, U6F0006, U6F0007, U6F0009, U6F0010 and U6F0011</p> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-103, Flight 35 OV-104, Flight 30 OV-105, Flight 21	
345	S115123AR5	03/03/08	<p>The following requirement is waived to allow OV-105 to fly with the following out-of-configuration condition:</p> <p>Tech Order M072-544504-009, (CATIA) RMS elbow camera, fly with the RMS elbow camera/PTU assembly angle change from 10.6 degrees to 0 degrees for STS-123 launch.</p> <p>A dynamic clearance assessment for STS-123 identified an interference between the camera/PTU assembly and the Payload Bay Door radiators. A decision was made to change the tilt angle from 10.6 degrees to 0 degrees for launch.</p>	OV-105, Flight 21	

Prepared by: Jeff McRoberts
USA RV/DR
861-2505

05/12/2009

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad
346	S115126AR3	05/16/08	<p>The following requirement is waived to allow OV-105 (STS-400/LON) to fly with the following out-of-configuration condition:</p> <p>Allow the use of STS-126 reconfiguration engineering products on OV-105 Flight 22 for the configuration of STS-400 (engineering reflects STS-126 requirements and vehicle is in STS-400 configuration at roll-out, as-designed vs. as-built).</p> <p>Given time constraints after STS-400 is ordered to launch, approval of this configuration waiver provides the least costly and most efficient means to document the STS-400 launch configuration.</p>	STS-400/LON (OV-105, Flight 22)	

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad												
347	S115126AR5	08/22/2008	<p>The following requirement is waived to allow OV-105 (STS-400/LON) to fly with the following out-of-configuration condition:</p> <p>Active latches without extended guides in Bays 8 and 12 will replace the respective STS-126 requirements:</p> <table><tbody><tr><td>Bay 8 STBD</td><td>M072-544201-203</td></tr><tr><td>Bay 8 Port</td><td>M072-544201-204</td></tr><tr><td>BAY 12 STBD</td><td>M072-544101-028</td></tr><tr><td>Bay 12 Port</td><td>M072-544101-027</td></tr></tbody></table> <p>Latches changed from secondary to primary:</p> <table><tbody><tr><td>Bay 12 STBD</td><td>M072-002112-043 Partial in Lieu of M072-002212-045</td></tr><tr><td>Bay 12 Port</td><td>M072-002112-044 Partial in Lieu of M072-002212-046</td></tr></tbody></table> <p>The following Tech Orders will not be installed:</p> <p>M072-000423-001 M072-710801-001 M072-544001-008</p> <p>The following Tech Orders will be partially installed:</p> <p>M072-544752-003 ROEU installed but not mated and grease application not accomplished.</p> <p>M072-000442-004 Orbiter aft bulkhead handrails removed, but LMC installation not accomplished.</p> <p>M072-002113-003 and M072-002113-004 latch cap bolt MD111-4026-1635 torque to 20 +/- 5 ft-lbs.</p>	Bay 8 STBD	M072-544201-203	Bay 8 Port	M072-544201-204	BAY 12 STBD	M072-544101-028	Bay 12 Port	M072-544101-027	Bay 12 STBD	M072-002112-043 Partial in Lieu of M072-002212-045	Bay 12 Port	M072-002112-044 Partial in Lieu of M072-002212-046	STS-400/LON (OV-105, Flight 22)	
Bay 8 STBD	M072-544201-203																
Bay 8 Port	M072-544201-204																
BAY 12 STBD	M072-544101-028																
Bay 12 Port	M072-544101-027																
Bay 12 STBD	M072-002112-043 Partial in Lieu of M072-002212-045																
Bay 12 Port	M072-002112-044 Partial in Lieu of M072-002212-046																

Prepared by: Jeff McRoberts
USA RV/DR
861-2505

05/12/2009

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad
348	S115126AR7	12/17/2008	<p>The following requirement, approved baseline return configuration, is waived to allow OV-105 to ferry from DFRC to KSC with out-of-configuration conditions for H2 and O2 supply line valves for fuel cell #2.</p> <p>During power operations, loss of power occurred on main B Bus. Fuel cell #2 coolant pump experienced a loss of power at this time due to the fact that Bus B provides AC2 power to fuel cell #2. Because of this loss of power, an overtemp condition may have occurred. During ferry, fuel cell #2 will be flown in a depressurized state. The addition of the jumper to the H2 and O2 lines is required to avoid potential damage to the fuel cell. This additional hardware is not part of the ferry flight configuration. Discharge water line from the fuel cell has been disconnected and secured in place. Reason being is this allows the removal of the water from the fuel cell and Orbiter line separately for freeze protection during ferry.</p> <p>***** SEE NSTS 07700 VOLUME IV BOOK 2 FOR COMPLETE DETAILS *****</p>	OV-105, Flight 22 (Ferry Flight)	

ACTIVE WAIVERS FOR
OV-105

Item #	Authority	Date	Waiver Description	Effectivity	Wad
349	S115126AR7	12/17/2008	<p>The following requirement, approved baseline return configuration, is waived to allow OV-105 to ferry from DFRC to KSC with the following out-of configuration conditions:</p> <p>Discharge water line disconnected from fuel cell.</p> <p>TCS insulation blanket V070-362917-001 not installed.</p> <p>TCS blanket covers a frame and GSE disconnects. During ferry flight, temperatures will not be high enough or low enough to damage Orbiter hardware. TCS blanket V070-362917-001 was inadvertently left out of the midbody before Door 44 was installed for ferry flight. Discharge water line from the fuel cell has been disconnected and secured in place. Reason being is this allows the removal of the water from the fuel cell and Orbiter line separately for freeze protection during ferry.</p>	OV-105, Flight 22 (Ferry Flight)	